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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/606,690 | 06/26/2003 | Ralph E. Taylor-Smith | LU05013USU | 5368 |
| 34408 | 7590 | 01/02/2008 | EXAMINER | |
| THE ECLIPSE GROUP 10605 BALBOA BLVD., SUITE 300 GRANADA HILLS, CA 91344 | | | MATOCHIK, THOMAS L | |
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| | | | 1796 | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/606,690

Applicant(s)

TAYLOR-SMITH, RALPH E.

Examiner

Thomas Matochik

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-13, 15-25, 27-30, 32-34, 36-41 and 43-45 is/are rejected.
- 7) ☒ Claim(s) 9, 14, 26, 31, 35 and 42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :9/29/2003, 10/16/2003, 2/11/2005.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. **Claim 2** lists a group of metals to be selected from and ***mixtures***. It is unclear if ***mixtures*** are comprised of those the group listed or any mixture of metals. Appropriate correction is requested. For purposes of further examination, it is assumed that the phrase should read "***mixtures thereof***".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 6-8, 12-13, 15-18, 20, 22-25, 29-30, 32-34 and 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor-Smith et.al. (***Erbium Doped Polysilsesquioxane Molecular Composite Systems***, presented at the Fall meeting of ACS, August 20-24, 2000 in the Division of Polymeric Materials and Engineering).

Regarding independent claim 1: Taylor-Smith teaches a bridged polysesquioxane composition comprising a host matrix of sesquioxane moieties comprising a metallic element and organic moieties interposed between the sesquioxane moieties (Figure 1) and at least some of the organic moieties comprise electron withdrawing fluorine atoms (Figure 1). The composition also includes guest molecule comprising a lanthanide atom (Figure 2).

Regarding claims 2, 4 and 6-8: Taylor-Smith teaches the composition contains a silicon metallic element (Conclusions section), a guest molecule containing an Erbium atom (Figure 2), an electron withdrawing fluorine atom and an electron donating nitrogen atom. It is taught that the bridged polysesquioxane host matrix is a polysilsesquioxane (Figure 1).

Regarding claims 12-13 and 15-16: Taylor-Smith teaches the electron withdrawing group is derived from a octafluorohexanediol derivative containing eight fluorine atoms (57% fluorine) and the electron donating group is derived from a triethoxy carbamate derivative (Experimental section, lines 1 and 2).

Regarding claims 34, 38-40: Taylor-Smith teaches a gain medium composition comprising a bridged silsesquioxane Erbium complex having an emission range between 1440 and 1640 nanometers (Figure 4). He also teaches the composition was formed into thin films by solvent casting for optical evaluations (Experimental section).

Regarding independent claim 17: Taylor-Smith teaches a process for making the bridged polysesquioxane composition by providing a host matrix of sesquioxane moieties comprising a metallic element and organic moieties interposed between the

sesquioxane moieties and at least some of the organic moieties comprise electron withdrawing fluorine atoms. The composition also includes guest molecule comprising a lanthanide atom (Experimental section).

Regarding claims 18 and 20: Taylor-Smith teaches a process whereby the metallic component of the bridged sesquioxane is silicon, the lanthanide metal in the guest molecule is Erbium (Experimental section).

Regarding claims 22 and 25: Taylor-Smith teaches a process whereby 91% of the silicon moieties are condensed into silsesquioxane moieties (Results and Discussion section, 2nd paragraph).

Regarding claims 23-24, 29-30 and 32-33: Taylor-Smith teaches a process whereby fluorine electron withdrawing atoms are attached to hexanediol monomer and carbamate electron donating groups are reacted to form the bridged silsesquioxane. Taylor-Smith also teaches the electron withdrawing group is derived from a octafluorohexanediol derivative containing eight fluorine atoms (57% fluorine) and the electron donating group is derived from a triethoxy carbamate derivative (Experimental section, lines 1 and 2).

Regarding independent claim 41: Taylor-Smith teaches an active material comprising a bridged polysesquioxane composition comprising a host matrix of sesquioxane moieties comprising a metallic element and organic moieties interposed between the sesquioxane moieties (Figure 1) and at least some of the organic moieties comprise electron withdrawing fluorine atoms (Figure 1). The composition also includes a guest

molecule comprising a lanthanide atom (Figure 2) and having an emission range between 1440 and 1640 nanometers (Figure 4).

Regarding claim 45: Taylor-Smith teaches an active material comprising a bridged silsesquioxane Erbium complex containing eight fluorine atoms (57% fluorine) and the electron donating group is derived from a triethoxy carbamate derivative (Experimental section, lines 1 and 2) and having an emission range between 1440 and 1640 nanometers (Figure 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 10, 19, 27, 36 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor-Smith et.al (***Erbium Doped Polysilsesquioxane Molecular Composite Systems***, presented at the Fall meeting of ACS, August 20-24, 2000 in the Division of Polymeric Materials and Engineering) as applied to claims 1, 17, 34 and 41 above, and further in view of Fan et.al (***Luminescence Behavior of the Europium (III) complexes with Hexafluoroacetylacetonate in the ORMASIL Matrices***, Materials Science and Engineering, Vol. B100, 147-151, May , 2003).

Regarding claims 3, 10, 19, 27, 36 and 43: Taylor-Smith teaches a bridged polysilsesquioxane composition comprising a host matrix of siloxane moieties and

organic moieties interposed between the siloxanes (Figure 1) and a guest molecule comprising a lanthanide atom (Figure 2). Taylor-Smith does not teach the guest molecule as being an aromatic complex. Fan, However, teaches a Europium hexafluoroacetylacetonate (HFA) complex embedded in a siloxane sol-gel (ORMASIL) for use in optical amplifiers and lasers (page 1, Abstract and Introduction). Taylor-Smith and Fan are analogous art since they both are from the same field of endeavor, namely lanthanide series organometallic complexes for fluorescence applications. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the organometallic complex of Fan in the composition of Taylor-Smith to increase the luminance efficiency of the lanthanide. It is well known in the art that the uv chromophoric, organic portion of the complex increases the absorption coefficient and through a transfer process energy is transferred to the metal more efficiently.

Claims 5 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor-Smith et.al (***Erbium Doped Polysilsesquioxane Molecular Composite Systems***, presented at the Fall meeting of ACS, August 20-24, 2000 in the Division of Polymeric Materials and Engineering) as applied to claims 1 and 17 above, and further in view of Choi et.al, (***Amorphous Polysilsesquioxanes as a Confinement Matrix for Quantum Sized Particle Growth, Size Analysis and Quantum Size Effect of CdS Particle Grown in Porous Polysilsesquioxanes***, J. Phys. Chem., Vol. 98, 3207-3214, 1994).

Regarding claims 5 and 21: Taylor-Smith does not discuss the possibility of incorporating the invention with quantum dot particles. Choi, however, teaches preparing a polysilsesquioxane matrix for use as a medium for the growth of quantum sized CdS particles (page 3208, Figure 2). Taylor-Smith and Choi are analogous art namely, the preparation of high performance semiconductor materials. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the quantum sizing application of Choi with the polysilsesquioxane composition of Taylor-Smith to gain enhanced lanthanide fluorescence.

Claims 11, 28, 37 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor-Smith et.al (***Erbium Doped Polysilsesquioxane Molecular Composite Systems***, presented at the Fall meeting of ACS, August 20-24, 2000 in the Division of Polymeric Materials and Engineering) as applied to claims 1, 3, 17, 19, 34 and 41 above and in view of Kolodner et.al (US 5,971,610).

Regarding claims 11, 28, 37 and 44: Taylor-Smith teaches a bridged polysilsesquioxane composition comprising a host matrix of siloxane moieties and organic moieties interposed between the siloxanes (Figure 1) and a guest molecule comprising a lanthanide atom (Figure 2). Taylor-Smith does not teach the guest molecule as being a camphor type diketonate complex. Kolodner, However, teaches a Europium 3-heptafluoropropylhydroxymethylene-camphorate (HFC) complex (col. 2, lines 46-47) which exhibit bright, narrow band fluorescence when exposed to UV light (col. 1, lines 1-4). This compound is used as an NMR shift reagent and also as a

catalyst but Kolodner teaches that it is also a strong fluorophore. Taylor-Smith and Kolodner are analogous art since they both are from the same field of endeavor, namely lanthanide series organometallic complexes for fluorescence applications. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the organometallic complex of Kolodner in the composition of Taylor-Smith to tune the absorption/emission bands.

Allowable Subject Matter

Claims 9, 14, 26, 31, 35 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The allowable subject matter concerns the dihydroxyquinoline/phenolic lanthanide complex which is enclosed within a polysilsesquioxane matrix and is not found in the prior art.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Matochik whose telephone number is 571-270-3291. The examiner can normally be reached on Monday-Friday 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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TLM
12/13/2007

A handwritten signature in black ink, appearing to read 'M. Eashoo', with a long horizontal flourish extending to the right.

MARK EASHOO, PH.D.
SUPERVISORY PATENT EXAMINER

26/Dec 07